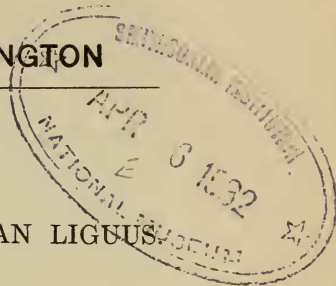


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THREE NEW SUBSPECIES OF FLORIDIAN LIGUUS

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Investigations during 1931 in localities in south Florida never explored before by a malacological research worker and examination of new material from older stations have revealed the presence of at least three new subspecies of the genus *Liguus*.

A new station in the Pinecrest area of the South Central Everglades has yielded a good series of specimens of a race that heretofore has been collected only rarely. The East Coast mainland ridge has provided a distinctly different race, never reported prior to 1931, while a sufficient series of the third form to entitle it to recognition as a valid entity has been collected on Lower Matecumbe key.

*Liguus fasciatus fuscoflammellus*, subsp. nov.

*Description*.—Shell solid, elongate and lustrous, with flattened to slightly rounded whorls. Sutures moderately well impressed. Palatal lip unthickened. Parietal wall smooth and bearing merest trace of callosity. Columella slightly twisted and moderately truncate. Color, axial region white, with non-pigmented area of nuclear whorls extending through third whorl. The color pattern consists of flame-like, golden brown axial striations wavering across a rich yellow ground color, giving the effect of alternating brown and yellow flames that extend uninterruptedly from suture to suture on the fourth, fifth and sixth whorls and flash in unbroken order across the body whorl to coalesce in a rufous mass in the region bordering the columella. The brown flames range in color from a dark mahogany to a tone but slightly deeper than the yellow ground color. A well-defined peripheral line of dark purple is present. The brown flames in some specimens assume an occasional bluish hue. There are seven whorls. Sculpture of fine growth lines.

<i>Length</i>	<i>Width</i>	<i>Ap. length</i>	<i>Ap. width</i>
39.2 mm.	22 mm.	16.8 mm.	10 mm. <i>Holotype</i>
41.4 mm.	23.3 mm.	17 mm.	10.2 mm. <i>Paratype</i>
44 mm.	24.1 mm.	18.7 mm.	11.1 mm. <i>Paratype</i>

Holotype in private collection of author, Timm's Hammock, Florida East Coast mainland ridge. Collected by author in August, 1931. Paratypes in private collections of Richard F. Deckert, Miami, and Albert Pflueger, Miami, from Timm's and Cox Hammocks respectively, collected by Mr. Pflueger in August, 1931.

*Remarks.*—This subspecies is one of the best-defined Florida forms and also is one of the rarest, but may be expected to occur in various localities on the Florida East Coast mainland ridge. It has been reported from two localities only, Cox and Timm's Hammocks. It may be considered one of the latest forms to evolve in south Florida. Although specimens of *Liguus* have been collected from Cox and Timm's Hammocks for many years, the first specimen of *fuscoflammellus* was not reported until August, 1931, when Albert Pflueger found one in Cox Hammock. The same month I found one in Timm's and later Mr. Pflueger collected one in the same locality. Since then, two other specimens have been taken in Timm's Hammock.

A similar form has been collected, but it differs in that the axial region is pink and flame-like markings are less sweeping in their character. When first found, the shell was regarded as an unusual sport or hybrid, but the occurrence of an identical form in two well-separated localities and the discovery of several individuals that vary little mark the form as a distinct race.

It is significant that Timm's Hammock is the type locality of *Liguus fasciatus alternatus* Simpson, a subspecies characterized by alternating brown and yellow markings. *Alternatus*, however, is a banded type of shell and in no way similar to *fuscoflammellus* except in the color sequence. Cox Hammock, however, never has yielded a specimen of *alternatus*.

#### ***Liguus fasciatus clenchi*, subsp. nov.**

*Description.*—Shell is medium-sized, sub-solid to barely solid, polished. It is regular in shape, tending to globosity in some specimens. There are seven whorls, moderately convex customarily and strongly convex in globose forms. First nuclear whorl pink, and very faintly so in some specimens; second, third and sometimes fourth whorls white, but usually brownish flecks on fourth whorl. Sutures well impressed. Columella generally whitish, but usually pink at base, moderately truncate and slightly twisted. Palatal lip emarginate in solid forms and smooth in sub-solid ones. Parietal wall thinly calloused.

*Color pattern.*—Ground color of rich yellow to faded canary yellow; reddish brown striations on fifth whorl, broadening into blotches and splashes of watery blue, brown and dull red on sixth and body whorls; distinct, very dark brown sub-sutural band averaging 2 mm. in width and narrower, usually broken supra-sutural band. Blending of reddish, bluish and brownish wash gives shell decided rufous cast. Break in general color pattern forms a more or less distinct peripheral zone of ground color in typical specimens. Basal area washed by intensified admixture of blue, red and brown hues, with broken band of same tones on region bordering

columella. Faint spiral green lines present on most specimens. Sutures always whitish or yellow. A lighter form of this race, usually a globose shell, is marked only by the brown sub-sutural zone and a broken supra-sutural one, sometimes appearing as mere flecks. The body whorl in this form is marked only by a faded yellowish ground color with an occasional faint reddish brown wash. A ragged-edged reddish brown band invariably is present on the region bordering the columella. A darker form of *clenchi* is similar to *Liguus fasciatus barbouri* Clench, but usually has outstanding green cuticular lines and is always differentiated by the pink apex. This form usually has a deep red peripheral band and blackish basal area.

<i>Length</i>	<i>Width</i>	<i>Ap. Length</i>	<i>Ap. width</i>
45.8 mm.	27.4 mm.	20.8 mm.	13 mm. <i>Holotype</i>

*Holotype* in private collection of author, from Pinecrest region, central Everglades, Florida, Hammock No. 46 (M. C. Z. number), collected by author in November, 1931. *Paratypes*, in Museum of Comparative Zoology from Pinecrest Hammock No. 46, collected by author, and in private collection of Richard F. Deckert, Miami, from same locality, collected by Mr. Deckert.

*Remarks*.—Single specimens of this form have been found rarely in various hammocks of the Pinecrest region for some time, but no distinct group was discovered until late in 1931, when R. F. Deckert and the author found a quantity in a hammock located in the northeastern part of the Pinecrest region.

The race previously had been loosely classified as *Liguus fasciatus testudineus* Pilsbry by collectors who possessed it, although the form in no way remotely resembles typical forms of *testudineus*. In a general way, many of the specimens resemble *L. fasciatus farnumi* Clench, *L. fasciatus barbouri* Clench, and *L. fasciatus floridanus* Clench, but always may be distinguished by the pinkish apex. The race is a distinct Pinecrest form and it is unlikely it will be found to occur elsewhere in south Florida.

***Liguus solidus splendidus*, subsp. nov.**

*Description*.—Shell medium to large, very highly polished, elongate, with rather flattened whorls, although some specimens have moderately convex body whorls. Entire axial region white. Ground color creamy yellow to lustrous yellowish brown, with dark brown and bluish axial smears on body whorl. Dark brown smears, flecks and flames extending from suture to suture on third, fourth, fifth and sixth whorls, but appearing mostly as richly-hued flames on fifth whorl. Squarish and blotchy brown spots on sutures of sixth and body whorls, with sub-sutural spots generally square and spaced regularly, but supra-sutural spots irregular and smeared. Brownish markings occasionally fade into a slaty blue. Distinct reddish brown peripheral line, with rufous smear on basal area. Broken band on area adjoining columella. Palatal lip smooth and unthickened within,

columella thin and straight or slanting. Parietal wall uncalloused. Spiral green lines usually present, particularly on basal area.

<i>Length</i>	<i>Width</i>	<i>Ap. length</i>	<i>Ap. width</i>
50 mm.	27 mm.	21 mm.	12.5 mm. <i>Holotype</i>

*Holotype* in private collection of author, from middle hammock of Lower Matecumbe key, Florida, collected by author in summer of 1931. *Paratypes* in Museum of Comparative Zoology and in private collections of R. F. Deckert and Dr. M. P. DeBoe, Miami, all collected in middle hammock of Lower Matecumbe key.

*Remarks.*—Charles Torrey Simpson (1920, Proc. Biol. Soc. Washington, vol. 33, p. 122), describes a dark form of *Liguus solidus pseudopictus* Simpson with "broad, brown zigzag stripes." Due to the fact that *splendidus* is one of the rarest of all Floridian *Liguus* forms, only a few specimens were available for study a decade ago. Collectors have ascribed it to *pseudopictus*, but differentiated it to the extent of calling it "dark *pseudopictus*." In view of material now at hand for study, it is apparent that *splendidus* is a distinct race, with no *true* intermediate forms between it and *pseudopictus*. The latter frequently is very richly colored, but the axial striations on the upper whorls always have a bluish cast, while those of *splendidus* always are dark brown. The ground color of typical specimens is a much richer brown than occurs on even the darkest *pseudopictus*. The new subspecies, like *pseudopictus*, is found only in the middle hammock of Lower Matecumbe key, and occurs, in a broad ratio, of about 1 to 50 with *pseudopictus*.